

Docket No.: NHL-FMW-02A US(SCT)  
Serial No.: 09/829,409  
Customer No.: 00432

**Claim Amendments**

1-44. (canceled)

45. (currently amended) A flat float glass comprising:

platinum, rhodium, zinc oxide, and tin dioxide, wherein:

the concentration of said platinum is contained in a non-zero amount less than 300 parts per billion;

the concentration of said rhodium is contained in a non-zero amount less than 30 parts per billion;

the concentration of said zinc oxide is contained in a non-zero amount less than 1.5 weight percent;

the concentration of said tin dioxide is contained in a non-zero amount less than 1 weight percent;

said concentrations of said platinum, said rhodium, said zinc oxide, and said tin dioxide configuring said flat float glass to have minimized surface defects; and

said flat float glass being configured to be one of:

prestressable into a glass-ceramic comprising one of:

high quartz mixed crystals; and

keatite mixed crystals; and

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transformable into a glass-ceramic comprising one of:

high quartz mixed crystals; and

keatite mixed crystals.

46. (original) The flat float glass according to claim 45, wherein:

said flat float glass comprises refined glass;

said refined glass being substantially free of both of (i.) and

(ii.):

(i.) arsenic oxide; and

(ii.) antimony oxide;

to minimize surface metallic coatings.

47. (original) The flat float glass according to claim 46, wherein

said flat float glass comprises a lithium oxide - aluminum oxide -

silicon dioxide glass.

48. (currently amended) The flat float glass according to claim

47, wherein said flat float glass contains in weight percent on an

oxide basis:

lithium oxide (~~LiO<sub>2</sub>~~) (Li<sub>2</sub>O)                      3.2-5.0

aluminum oxide (Al<sub>2</sub>O<sub>3</sub>)                      19-25

silicon dioxide (SiO<sub>2</sub>)                      55-69.

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49. (original) The flat float glass according to claim 48, wherein said flat float glass further contains in weight percent on an oxide basis:

sodium oxide ( $\text{Na}_2\text{O}$ ) 0-1.5

potassium oxide ( $\text{K}_2\text{O}$ ) 0-1.5

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ )

+ potassium oxide ( $\text{K}_2\text{O}$ ) 0.2-2.0

magnesium oxide ( $\text{MgO}$ ) 0.1-2.2

calcium oxide ( $\text{CaO}$ ) 0-1.5

strontium oxide ( $\text{SrO}$ ) 0-1.5

barium oxide ( $\text{BaO}$ ) 0-2.5

zinc oxide ( $\text{ZnO}$ )  $\leq 1.5$

titanium dioxide ( $\text{TiO}_2$ ) 1.0-5.0

zirconium dioxide ( $\text{ZrO}_2$ ) 1.0-2.5

tin dioxide ( $\text{SnO}_2$ )  $\leq 1.0$

with the sum of titanium dioxide ( $\text{TiO}_2$ ) + zirconium ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 2.5-5.0

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-3.0.

50. (original) The flat float glass according to claim 46,

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comprising one of (i.), (ii.), (iii.), (iv.), (v.), (vi.), (vii.), (viii.), (ix.),  
(x.), (xi.), (xii.), and (xiii.):

(i.) said flat float glass comprises in weight percent on an oxide  
basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.2-5.0 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )                       | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )                     | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )                           | <1.0    |

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with the sum of titanium dioxide ( $\text{TiO}_2$ ) +

zirconium dioxide ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 2.5-5.0

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-3.0;

(ii.) said flat float glass comprises colored glass;

said colored glass comprises a coloring agent;

said coloring agent comprises at least one compound of:

vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(iii.) said flat float glass comprises in weight percent on an  
oxide basis a composition of:

lithium oxide ( $\text{Li}_2\text{O}$ ) 3.5-4.5

sodium oxide ( $\text{Na}_2\text{O}$ ) 0.2-1.0

potassium oxide ( $\text{K}_2\text{O}$ ) 0-0.8

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) +

potassium oxide ( $\text{K}_2\text{O}$ ) 0.4-1.5

magnesium oxide ( $\text{MgO}$ ) 0.3-2.0

calcium oxide ( $\text{CaO}$ ) 0-1.0

strontium oxide ( $\text{SrO}$ ) 0-1.0

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|  |            |
|--|------------|
| barium oxide (BaO)                                     | 0-2.5      |
| zinc oxide (ZnO)                                       | $\leq 1.0$ |
| aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )       | 19-24      |
| silicon dioxide (SiO <sub>2</sub> )                    | 60-68      |
| titanium dioxide (TiO <sub>2</sub> )                   | 1.0-2.0    |
| zirconium dioxide (ZrO <sub>2</sub> )                  | 1.2-2.2    |
| tin dioxide (SnO <sub>2</sub> )                        | $\leq 0.6$ |
| with the sum of titanium dioxide (TiO <sub>2</sub> ) + |            |
| zirconium dioxide (ZrO <sub>2</sub> ) +                |            |
| tin dioxide (SnO <sub>2</sub> )                        | 3.0-4.5    |
| phosphoric oxide (P <sub>2</sub> O <sub>5</sub> )      | 0-2.0;     |

(iv.) said flat float glass comprises glass being configured to be chemically prestressable; and

the sum of the percentage of lithium oxide (Li<sub>2</sub>O) and the percentage of sodium oxide (Na<sub>2</sub>O) being greater than 3.5 percent by weight based on oxide;

(v.) said flat float glass comprises chemically prestressable glass;

(vi.) said flat float glass comprises:

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the sum of 3.2 times the percentage of zinc oxide ( $\text{ZnO}$ ) and the percentage of titanium dioxide ( $\text{TiO}_2$ ) being equal to or less than 4.3 weight percent based on oxide to minimize surface crystal bands;

(vii.) said flat float glass comprises:

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

less than 2.5 weight percent of titanium dioxide ( $\text{TiO}_2$ ), on an oxide basis;

to minimize coloration due to iron oxide and titanium dioxide upon vitrification of said flat float glass;

(viii.) said flat float glass comprises glass being configured to have, at a thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(ix.) said flat float glass being substantially free of: barium oxide ( $\text{BaO}$ );

(x.) said flat float glass is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree

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Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius;

(xi.) said flat float glass comprises one of:

(a.) a flat float glass being configured to be transformable into one of:

a transparent glass-ceramic;

a translucent glass-ceramic; and

an opaque glass-ceramic;

(b.) a flat float glass being configured to be transformable into a glass-ceramic comprising keatite mixed crystals as the predominant crystal phase and said flat float glass being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a flat float glass being configured to be transformable into a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said flat float glass being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in



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the range of one of:

from minus 0.5 five millionths per degree Kelvin to  
0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15  
millionths per degree Kelvin;

(xii.) said flat float glass comprises a flat float glass  
transformable into a transparent glass-ceramic;  
said glass-ceramic comprising in weight percent based on oxide:  
less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );  
less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and  
less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
said glass-ceramic being configured to have a light  
transmittance, at 4 millimeters thickness, of less than eighty percent;

(xiii.) said flat float glass comprises a flat float glass being  
configured to be transformable into a glass-ceramic;

said glass-ceramic being colored with a coloring agent  
comprising at least one compound of: vanadium (V), chromium (Cr),  
manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said glass-ceramic being configured to have a light transmittance

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of less than five percent at a thickness of 4 millimeters.

51. (original) The flat float glass according to claim 46,  
comprising all of: (i.), (ii.), (iii.), (iv.), (v.), and (vi.):

(i.) one of (a.) and (b.):

(a.) said flat float glass comprises in weight percent on an  
oxide basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.2-5.0 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )                       | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-5.0 |

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zirconium dioxide ( $\text{ZrO}_2$ ) 1.0-2.5

tin dioxide ( $\text{SnO}_2$ ) <1.0

with the sum of titanium dioxide ( $\text{TiO}_2$ ) +

zirconium dioxide ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 2.5-5.0

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-3.0; and

(b.) said flat float glass comprises in weight percent on an  
oxide basis a composition of:

lithium oxide ( $\text{Li}_2\text{O}$ ) 3.5-4.5

sodium oxide ( $\text{Na}_2\text{O}$ ) 0.2-1.0

potassium oxide ( $\text{K}_2\text{O}$ ) 0-0.8

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) +

potassium oxide ( $\text{K}_2\text{O}$ ) 0.4-1.5

magnesium oxide ( $\text{MgO}$ ) 0.3-2.0

calcium oxide ( $\text{CaO}$ ) 0-1.0

strontium oxide ( $\text{SrO}$ ) 0-1.0

barium oxide ( $\text{BaO}$ ) 0-2.5

zinc oxide ( $\text{ZnO}$ )  $\leq 1.0$

aluminum oxide ( $\text{Al}_2\text{O}_3$ ) 19-24

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|   |            |
|---|------------|
| silicon dioxide ( $\text{SiO}_2$ )                    | 60-68      |
| titanium dioxide ( $\text{TiO}_2$ )                   | 1.0-2.0    |
| zirconium dioxide ( $\text{ZrO}_2$ )                  | 1.2-2.2    |
| tin dioxide ( $\text{SnO}_2$ )                        | $\leq 0.6$ |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) + |            |
| zirconium dioxide ( $\text{ZrO}_2$ ) +                |            |
| tin dioxide ( $\text{SnO}_2$ )                        | 3.0-4.5    |
| phosphoric oxide ( $\text{P}_2\text{O}_5$ )           | 0-2.0;     |

(ii.) said flat float glass comprises the sum of 3.2 times the percentage of zinc oxide ( $\text{ZnO}$ ) and the percentage of titanium dioxide ( $\text{TiO}_2$ ) being equal to or less than 4.3 weight percent based on oxide to minimize surface crystal bands;

(iii.) said flat float glass comprises:

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

less than 2.5 weight percent of titanium dioxide ( $\text{TiO}_2$ ), on an oxide basis;

to minimize coloration due to iron oxide and titanium dioxide upon vitrification of said flat float glass;

(iv.) said flat float glass comprises glass configured to have, at

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a thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(v.) said flat float glass being substantially free of:

barium oxide (BaO);

(vi.) said flat float glass is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius.

52. (original) The flat float glass according to claim 51 comprising one of (viii.), (ix.), (x.), (xi.), and (xii.):

(viii.) said flat float glass comprises colored glass;

said colored glass comprises a coloring agent;

said coloring agent comprising at least one compound of:

vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

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(ix.) said flat float glass comprises one of:

(a.) a flat float glass being configured to be transformable into one of:

- a transparent glass-ceramic;
- a translucent glass-ceramic; and
- an opaque glass-ceramic;

(b.) a flat float glass being configured to be transformable into a glass-ceramic comprising keatite mixed crystals as the predominant crystal phase and said flat float glass being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a flat float glass being configured to be transformable into a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said flat float glass being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of one of:

- from minus 0.5 five millionths per degree Kelvin to 0.5 millionths per degree Kelvin; and
- minus 0.15 millionths per degree Kelvin to 0.15

millionths per degree Kelvin;

(x.) said flat float glass comprises a flat float glass configured to be transformable into a transparent glass-ceramic;

said glass-ceramic comprising in weight percent based on oxide:

less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );

less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

said glass-ceramic being configured to have a light transmittance, at 4 millimeters thickness, of less than eighty percent;

(xi.) said flat float glass comprises an flat float glass being configured to be transformable into a glass-ceramic;

said glass-ceramic being colored with a coloring agent comprising at least one compound of: vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said glass-ceramic being configured to have a light transmittance of less than five percent at a thickness of 4 millimeters; and

(xii.) said flat float glass comprises glass being configured to be chemically prestressable;

said chemically prestressable glass comprises the sum of the

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percentage of lithium oxide ( $\text{Li}_2\text{O}$ ) and the percentage of sodium oxide ( $\text{Na}_2\text{O}$ ) being greater than 3.5 percent by weight based on oxide.

53. (currently amended) A glass ceramic comprising:

platinum, rhodium, zinc oxide, and tin dioxide, wherein:

the concentration of said platinum is contained in a non-zero amount less than 300 parts per billion;

the concentration of said rhodium is contained in a non-zero amount less than 30 parts per billion;

the concentration of said zinc oxide is contained in a non-zero amount less than 1.5 weight percent;

the concentration of said tin dioxide is contained in a non-zero amount less than 1 weight percent; and

said glass ceramic comprising one of:

high quartz mixed crystals; and

keatite mixed crystals.

54. (currently amended) The glass ceramic according to claim 53, comprising one of (i.), (ii.), (iii.), (iv.), (v.), (vi.), (vii.), (viii.), (ix.), (x.), (xi.), (xii.), and (xiii.):

(i.) said glass ceramic comprises in weight percent on an oxide



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basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.2-5.0 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )                       | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )                     | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )                           | <1.0    |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) +    |         |
| zirconium dioxide ( $\text{ZrO}_2$ ) +                   |         |
| tin dioxide ( $\text{SnO}_2$ )                           | 2.5-5.0 |

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phosphoric oxide ( $P_2O_5$ ) 0-3.0;

(ii.) said glass ceramic comprises colored glass;

said colored glass comprises a coloring agent;

said coloring agent comprises at least one compound of:

vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(iii.) said glass ceramic comprises in weight percent on an oxide  
basis a composition of:

lithium oxide ( $Li_2O$ ) 3.5-4.5

sodium oxide ( $Na_2O$ ) 0.2-1.0

potassium oxide ( $K_2O$ ) 0-0.8

with the sum of sodium oxide ( $Na_2O$ ) +

potassium oxide ( $K_2O$ ) 0.4-1.5

magnesium oxide ( $MgO$ ) 0.3-2.0

calcium oxide ( $CaO$ ) 0-1.0

strontium oxide ( $SrO$ ) 0-1.0

barium oxide ( $BaO$ ) 0-2.5

zinc oxide ( $ZnO$ )  $\leq 1.0$

aluminum oxide ( $Al_2O_3$ ) 19-24

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|   |            |
|---|------------|
| silicon dioxide ( $\text{SiO}_2$ )                    | 60-68      |
| titanium dioxide ( $\text{TiO}_2$ )                   | 1.0-2.0    |
| zirconium dioxide ( $\text{ZrO}_2$ )                  | 1.2-2.2    |
| tin dioxide ( $\text{SnO}_2$ )                        | $\leq 0.6$ |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) + |            |
| zirconium dioxide ( $\text{ZrO}_2$ ) +                |            |
| tin dioxide ( $\text{SnO}_2$ )                        | 3.0-4.5    |
| phosphoric oxide ( $\text{P}_2\text{O}_5$ )           | 0-2.0;     |

(iv.) said glass ceramic comprises chemically prestressed float glass;

said chemically prestressed glass comprises: the sum of the percentage of lithium oxide ( $\text{Li}_2\text{O}$ ) and the percentage of sodium oxide ( $\text{Na}_2\text{O}$ ) being greater than 3.5 percent by weight based on oxide;

(v.) said glass ceramic comprises chemically prestressed glass;

(vi.) said glass ceramic comprises:

the sum of 3.2 times the percentage of zinc oxide ( $\text{ZnO}$ ) and the percentage of titanium dioxide ( $\text{TiO}_2$ ) being equal to or less than 4.3 weight percent based on oxide;

to minimize surface crystal bands;

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(vii.) said glass ceramic comprises:

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
less than 2.5 weight percent of titanium dioxide ( $\text{TiO}_2$ ), on an oxide basis;

to minimize coloration due to iron oxide and titanium dioxide upon vitrification of said ~~flat float glass~~ ceramic;

(viii.) said glass ceramic comprises glass being configured to have, at a thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(ix.) said glass ceramic being substantially free of barium oxide ( $\text{BaO}$ );

(x.) said glass ceramic is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius;

(xi.) said glass ceramic comprises one of:

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(a.) a glass ceramic comprising one of:

- a transparent glass-ceramic;
- a translucent glass-ceramic; and
- an opaque glass-ceramic;

(b.) a glass-ceramic comprising keatite mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of one of:

from minus 0.5 five millionths per degree Kelvin to 0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15 millionths per degree Kelvin;

(xii.) said glass ceramic comprises a transparent glass-ceramic comprising in weight percent based on oxide:

less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );

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less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and  
less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
said glass-ceramic being configured to have a light  
transmittance, at 4 millimeters thickness, of less than eighty percent;

(xiii.) said glass ceramic comprises a glass-ceramic being  
colored with a coloring agent comprising at least one compound of:  
vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
nickel (Ni);

said colored glass-ceramic being configured to have a light  
transmittance of less than five percent at a thickness of 4 millimeters;  
and

wherein said glass ceramic contains lithium oxide - aluminum  
oxide - silicon dioxide.

55. (original) The glass ceramic according to claim 53,  
comprising all of: (i.), (ii.), (iii.), (iv.), (v.), and (vi.):

(i.) one of (a.) and (b.):

(a.) said glass ceramic comprises in weight percent on an  
oxide basis a composition of:

|   |         |
|---|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ ) | 3.2-5.0 |
|---|---------|

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|  |         |
|--|---------|
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )                       | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )                     | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )                           | <1.0    |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) +    |         |
| zirconium dioxide ( $\text{ZrO}_2$ ) +                   |         |
| tin dioxide ( $\text{SnO}_2$ )                           | 2.5-5.0 |
| phosphoric oxide ( $\text{P}_2\text{O}_5$ )              | 0-3.0;  |

(b.) said glass ceramic comprises in weight percent on an

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oxide basis a composition of:

|  |            |
|--|------------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.5-4.5    |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0.2-1.0    |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-0.8      |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |            |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.4-1.5    |
| magnesium oxide ( $\text{MgO}$ )                         | 0.3-2.0    |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.0      |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.0      |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5      |
| zinc oxide ( $\text{ZnO}$ )                              | $\leq 1.0$ |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-24      |
| silicon dioxide ( $\text{SiO}_2$ )                       | 60-68      |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-2.0    |
| zirconium dioxide ( $\text{ZrO}_2$ )                     | 1.2-2.2    |
| tin dioxide ( $\text{SnO}_2$ )                           | $\leq 0.6$ |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) +    |            |
| zirconium dioxide ( $\text{ZrO}_2$ ) +                   |            |
| tin dioxide ( $\text{SnO}_2$ )                           | 3.0-4.5    |



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phosphoric oxide ( $P_2O_5$ ) 0-2.0;

(ii.) said glass ceramic comprises:

the sum of 3.2 times the percentage of zinc oxide ( $ZnO$ )  
and the percentage of titanium dioxide ( $TiO_2$ ) being equal to or  
less than 4.3 weight percent based on oxide;

to minimize surface crystal bands;

(iii.) said glass ceramic comprises:

less than 200 parts per million iron oxide ( $Fe_2O_3$ ); and  
less than 2.5 weight percent of titanium dioxide ( $TiO_2$ ), on an oxide  
basis;

to minimize coloration due to iron oxide and titanium  
dioxide upon vitrification;

(iv.) said glass ceramic comprises glass configured to have, at a  
thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(v.) said glass ceramic being substantially free of barium oxide  
( $BaO$ );

(vi.) said glass ceramic is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius; and  
wherein said glass ceramic contains lithium oxide - aluminum oxide - silicon dioxide.

56. (original) The glass ceramic according to claim 55 comprising one of (viii.), (ix.), (x.), (xi.), and (xii.):

(viii.) said glass ceramic comprises colored glass;  
said colored glass comprises a coloring agent;  
said coloring agent comprising at least one compound of:  
vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(ix.) said glass ceramic comprises one of:

(a.) a transparent glass-ceramic;  
a translucent glass-ceramic; and  
an opaque glass-ceramic;

(b.) a glass-ceramic comprising keatite mixed crystals as

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the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of one of:

from minus 0.5 five millionths per degree Kelvin to 0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15 millionths per degree Kelvin;

(x.) said glass ceramic comprises a transparent glass-ceramic comprising in weight percent based on oxide:

less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );

less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

said glass-ceramic being configured to have a light transmittance, at 4 millimeters thickness, of less than eighty percent;

(xi.) said glass ceramic comprises a glass-ceramic being colored

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with a coloring agent comprising at least one compound of: vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said colored glass-ceramic being configured to have a light transmittance of less than five percent at a thickness of 4 millimeters; and

(xii.) said glass ceramic comprises chemically prestressed glass;

said chemically prestressed glass comprises:

the sum of the percentage of lithium oxide ( $\text{Li}_2\text{O}$ ) and the percentage of sodium oxide ( $\text{Na}_2\text{O}$ ) being greater than 3.5 percent by weight based on oxide.

57. (currently amended) A float glass comprising:

platinum, wherein the concentration of said platinum is contained in a non-zero amount less than 300 parts per billion;

a concentration of rhodium in a non-zero amount less than 30 parts per billion;

a concentration of zinc oxide in a non-zero amount less than 1.5 weight percent;

a concentration of tin dioxide in a non-zero amount less than 1

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weight percent;

said concentrations of said platinum, rhodium, zinc oxide, and tin dioxide configuring said float glass to have minimized surface defects;  
and

said float glass being configured to be one of:

prestressable into a glass-ceramic comprising one of:

high quartz mixed crystals; and

keatite mixed crystals; and

transformable into a glass-ceramic comprising one of:

high quartz mixed crystals; and

keatite mixed crystals.

58. (currently amended) The float glass according to claim 57,  
wherein:

said float glass comprises rhodium, zinc oxide, and tin dioxide;

said float glass comprises refined glass;

said refined glass being substantially free of both of (i.) and

(ii.):

(i.) arsenic oxide; and

(ii.) antimony oxide;

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to minimize surface metallic coatings;

said float glass comprises a lithium oxide - aluminum oxide -  
silicon dioxide glass:-

said float glass contains in weight percent on an oxide basis:

|   |         |
|---|---------|
| lithium oxide ( <del>Li<sub>2</sub>O</del> ) ( <u>Li<sub>2</sub>O</u> ) | 3.2-5.0 |
| aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )                        | 19-25   |
| silicon dioxide (SiO <sub>2</sub> )                                     | 55-69-  |
| sodium oxide (Na <sub>2</sub> O)  | 0-1.5   |
| potassium oxide (K <sub>2</sub> O)                                      | 0-1.5   |
| with the sum of sodium oxide (Na <sub>2</sub> O)                        |         |
| + potassium oxide (K <sub>2</sub> O)                                    | 0.2-2.0 |
| magnesium oxide (MgO)   | 0.1-2.2 |
| calcium oxide (CaO)   | 0-1.5   |
| strontium oxide (SrO)   | 0-1.5   |
| barium oxide (BaO)  | 0-2.5   |
| zinc oxide (ZnO)  | ≤ 1.5   |
| titanium dioxide (TiO <sub>2</sub> )                                    | 1.0-5.0 |
| zirconium dioxide (ZrO <sub>2</sub> )                                   | 1.0-2.5 |
| tin dioxide (SnO <sub>2</sub> )   | ≤ 1.0   |

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with the sum of titanium dioxide ( $\text{TiO}_2$ ) + zirconium ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 2.5-5.0

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-3.0.

59. (original) The float glass according to claim 58, comprising one of (i.), (ii.), (iii.), (iv.), (v.), (vi.), (vii.), (viii.), (ix.), (x.), (xi.), (xii.), and (xiii.):

(i.) said float glass comprises in weight percent on an oxide basis a composition of:

lithium oxide ( $\text{Li}_2\text{O}$ ) 3.2-5.0

sodium oxide ( $\text{Na}_2\text{O}$ ) 0-1.5

potassium oxide ( $\text{K}_2\text{O}$ ) 0-1.5

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) +

potassium oxide ( $\text{K}_2\text{O}$ ) 0.2-2.0

magnesium oxide ( $\text{MgO}$ ) 0.1-2.2

calcium oxide ( $\text{CaO}$ ) 0-1.5

strontium oxide ( $\text{SrO}$ ) 0-1.5

barium oxide ( $\text{BaO}$ ) 0-2.5

zinc oxide ( $\text{ZnO}$ ) <1.5

aluminum oxide ( $\text{Al}_2\text{O}_3$ ) 19-25

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|   |         |
|---|---------|
| silicon dioxide ( $\text{SiO}_2$ )                    | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                   | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )                  | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )                        | <1.0    |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) + |         |
| zirconium dioxide ( $\text{ZrO}_2$ ) +                |         |
| tin dioxide ( $\text{SnO}_2$ )                        |         |
| phosphoric oxide ( $\text{P}_2\text{O}_5$ )           | 2.5-5.0 |
|   | 0-3.0;  |

(ii.) said float glass comprises colored glass;

said colored glass comprises a coloring agent;

said coloring agent comprises at least one compound of:

vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(iii.) said float glass comprises in weight percent on an oxide  
basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.5-4.5 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0.2-1.0 |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-0.8   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |



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|  |            |
|--|------------|
| potassium oxide ( $K_2O$ )                     | 0.4-1.5    |
| magnesium oxide ( $MgO$ )                      | 0.3-2.0    |
| calcium oxide ( $CaO$ )                        | 0-1.0      |
| strontium oxide ( $SrO$ )                      | 0-1.0      |
| barium oxide ( $BaO$ )                         | 0-2.5      |
| zinc oxide ( $ZnO$ )                           | $\leq 1.0$ |
| aluminum oxide ( $Al_2O_3$ )                   | 19-24      |
| silicon dioxide ( $SiO_2$ )                    | 60-68      |
| titanium dioxide ( $TiO_2$ )                   | 1.0-2.0    |
| zirconium dioxide ( $ZrO_2$ )                  | 1.2-2.2    |
| tin dioxide ( $SnO_2$ )                        | $\leq 0.6$ |
| with the sum of titanium dioxide ( $TiO_2$ ) + |            |
| zirconium dioxide ( $ZrO_2$ ) +                |            |
| tin dioxide ( $SnO_2$ )                        | 3.0-4.5    |
| phosphoric oxide ( $P_2O_5$ )                  | 0-2.0;     |

(iv.) said float glass comprises glass being configured to be chemically prestressable; and

the sum of the percentage of lithium oxide ( $Li_2O$ ) and the percentage of sodium oxide ( $Na_2O$ ) being greater than 3.5 percent by

weight based on oxide;

(v.) said float glass comprises chemically prestressable glass;

(vi.) said float glass comprises:

the sum of 3.2 times the percentage of zinc oxide ( $\text{ZnO}$ )  
and the percentage of titanium dioxide ( $\text{TiO}_2$ ) being equal to or  
less than 4.3 weight percent based on oxide to minimize surface  
crystal bands;

(vii.) said float glass comprises:

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

less than 2.5 weight percent of titanium dioxide ( $\text{TiO}_2$ ), on an  
oxide basis;

to minimize coloration due to iron oxide and titanium dioxide  
upon vitrification of said float glass;

(viii.) said float glass comprises glass being configured to have,  
at a thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(ix.) said float glass being substantially free of: barium oxide  
( $\text{BaO}$ );

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(x.) said float glass is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius;

(xi.) said float glass comprises one of:

(a.) a float glass being configured to be transformable into one of:

a transparent glass-ceramic;

a translucent glass-ceramic; and

an opaque glass-ceramic;

(b.) a float glass being configured to be transformable into a glass-ceramic comprising keatite mixed crystals as the predominant crystal phase and said float glass being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a float glass being configured to be transformable into

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a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said float glass being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of one of:

from minus 0.5 five millionths per degree Kelvin to 0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15 millionths per degree Kelvin;

(xii.) said float glass comprises a float glass transformable into a transparent glass-ceramic;

said glass-ceramic comprising in weight percent based on oxide:

less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );

less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

said glass-ceramic being configured to have a light transmittance, at 4 millimeters thickness, of less than eighty percent;

(xiii.) said float glass comprises a float glass being configured to be transformable into a glass-ceramic;

said glass-ceramic being colored with a coloring agent

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comprising at least one compound of: vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said glass-ceramic being configured to have a light transmittance of less than five percent at a thickness of 4 millimeters.

60. (original) The float glass according to claim 58, comprising all of: (i.), (ii.), (iii.), (iv.), (v.), and (vi.):

(i.) one of (a.) and (b.):

(a.) said float glass comprises in weight percent on an oxide basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.2-5.0 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |

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|  |         |
|--|---------|
| aluminum oxide ( $\text{Al}_2\text{O}_3$ ) | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )         | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )        | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )       | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )             | <1.0    |

with the sum of titanium dioxide ( $\text{TiO}_2$ ) +

zirconium dioxide ( $\text{ZrO}_2$ ) +

|                                |         |
|--------------------------------|---------|
| tin dioxide ( $\text{SnO}_2$ ) | 2.5-5.0 |
|--------------------------------|---------|

|   |            |
|---|------------|
| phosphoric oxide ( $\text{P}_2\text{O}_5$ ) | 0-3.0; and |
|---|------------|

(b.) said float glass comprises in weight percent on an  
oxide basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )  | 3.5-4.5 |
| sodium oxide ( $\text{Na}_2\text{O}$ )   | 0.2-1.0 |
| potassium oxide ( $\text{K}_2\text{O}$ ) | 0-0.8   |

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) +

|  |         |
|--|---------|
| potassium oxide ( $\text{K}_2\text{O}$ ) | 0.4-1.5 |
| magnesium oxide ( $\text{MgO}$ )         | 0.3-2.0 |
| calcium oxide ( $\text{CaO}$ )           | 0-1.0   |
| strontium oxide ( $\text{SrO}$ )         | 0-1.0   |

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|  |            |
|--|------------|
| barium oxide (BaO)                                     | 0-2.5      |
| zinc oxide (ZnO)                                       | $\leq 1.0$ |
| aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )       | 19-24      |
| silicon dioxide (SiO <sub>2</sub> )                    | 60-68      |
| titanium dioxide (TiO <sub>2</sub> )                   | 1.0-2.0    |
| zirconium dioxide (ZrO <sub>2</sub> )                  | 1.2-2.2    |
| tin dioxide (SnO <sub>2</sub> )                        | $\leq 0.6$ |
| with the sum of titanium dioxide (TiO <sub>2</sub> ) + |            |
| zirconium dioxide (ZrO <sub>2</sub> ) +                |            |
| tin dioxide (SnO <sub>2</sub> )                        | 3.0-4.5    |
| phosphoric oxide (P <sub>2</sub> O <sub>5</sub> )      | 0-2.0;     |

(ii.) said float glass comprises the sum of 3.2 times the percentage of zinc oxide (ZnO) and the percentage of titanium dioxide (TiO<sub>2</sub>) being equal to or less than 4.3 weight percent based on oxide to minimize surface crystal bands;

(iii.) said float glass comprises:  
less than 200 parts per million iron oxide (Fe<sub>2</sub>O<sub>3</sub>); and  
less than 2.5 weight percent of titanium dioxide (TiO<sub>2</sub>), on an oxide basis;

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to minimize coloration due to iron oxide and titanium dioxide upon vitrification of said float glass;

(iv.) said float glass comprises glass configured to have, at a thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(v.) said float glass being substantially free of:

barium oxide (BaO);

(vi.) said float glass is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius.

61. (original) The float glass according to claim 60 comprising one of (viii.), (ix.), (x.), (xi.), and (xii.):

(viii.) said float glass comprises colored glass;

said colored glass comprises a coloring agent;



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said coloring agent comprising at least one compound of:  
vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(ix.) said float glass comprises one of:

(a.) a float glass being configured to be transformable into  
one of:

a transparent glass-ceramic;  
a translucent glass-ceramic; and  
an opaque glass-ceramic;

(b.) a float glass being configured to be transformable into  
a glass-ceramic comprising keatite mixed crystals as the  
predominant crystal phase and said float glass being configured  
to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5  
millionths per degree Kelvin;

(c.) a float glass being configured to be transformable into  
a glass-ceramic comprising high quartz mixed crystals as the  
predominant crystal phase and said float glass being configured  
to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of  
one of:

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from minus 0.5 five millionths per degree Kelvin to  
0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15  
millionths per degree Kelvin;

(x.) said float glass comprises a float glass configured to be  
transformable into a transparent glass-ceramic;

said glass-ceramic comprising in weight percent based on oxide:  
less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );  
less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and  
less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
said glass-ceramic being configured to have a light  
transmittance, at 4 millimeters thickness, of less than eighty percent;

(xi.) said float glass comprises a float glass being configured to  
be transformable into a glass-ceramic;

said glass-ceramic being colored with a coloring agent  
comprising at least one compound of: vanadium (V), chromium (Cr),  
manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said glass-ceramic being configured to have a light transmittance  
of less than five percent at a thickness of 4 millimeters; and

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(xii.) said float glass comprises glass being configured to be chemically prestressable;

said chemically prestressable glass comprises the sum of the percentage of lithium oxide ( $\text{Li}_2\text{O}$ ) and the percentage of sodium oxide ( $\text{Na}_2\text{O}$ ) being greater than 3.5 percent by weight based on oxide.

62. (currently amended) A flat glass ceramic comprising:

platinum, wherein the concentration of said platinum is contained in a non-zero amount less than 300 parts per billion;

a concentration of rhodium in a non-zero amount less than 30 parts per billion;

a concentration of zinc oxide in a non-zero amount less than 1.5 weight percent;

a concentration of tin dioxide in a non-zero amount less than 1 weight percent; and

said flat glass ceramic comprising one of:

high quartz mixed crystals; and

keatite mixed crystals.

63. (original) The flat glass ceramic according to claim 62, comprising one of (i.), (ii.), (iii.), (iv.), (v.), (vi.), (vii.), (viii.), (ix.),

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(x.), (xi.), (xii.), (xiii.), and (xiv.):

(i.) said flat glass ceramic comprises in weight percent on an oxide basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.2-5.0 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )                       | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )                     | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )                           | <1.0    |
| with the sum of titanium dioxide ( $\text{TiO}_2$ ) +    |         |

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zirconium dioxide ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 2.5-5.0

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-3.0;

(ii.) said flat glass ceramic comprises colored glass;

said colored glass comprises a coloring agent;

said coloring agent comprises at least one compound of:

vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co),  
copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(iii.) said flat glass ceramic comprises in weight percent on an  
oxide basis a composition of:

lithium oxide ( $\text{Li}_2\text{O}$ ) 3.5-4.5

sodium oxide ( $\text{Na}_2\text{O}$ ) 0.2-1.0

potassium oxide ( $\text{K}_2\text{O}$ ) 0-0.8

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) +

potassium oxide ( $\text{K}_2\text{O}$ ) 0.4-1.5

magnesium oxide ( $\text{MgO}$ ) 0.3-2.0

calcium oxide ( $\text{CaO}$ ) 0-1.0

strontium oxide ( $\text{SrO}$ ) 0-1.0

barium oxide ( $\text{BaO}$ ) 0-2.5

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|  |            |
|--|------------|
| zinc oxide (ZnO)                                       | $\leq 1.0$ |
| aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )       | 19-24      |
| silicon dioxide (SiO <sub>2</sub> )                    | 60-68      |
| titanium dioxide (TiO <sub>2</sub> )                   | 1.0-2.0    |
| zirconium dioxide (ZrO <sub>2</sub> )                  | 1.2-2.2    |
| tin dioxide (SnO <sub>2</sub> )                        | $\leq 0.6$ |
| with the sum of titanium dioxide (TiO <sub>2</sub> ) + |            |
| zirconium dioxide (ZrO <sub>2</sub> ) +                |            |
| tin dioxide (SnO <sub>2</sub> )                        | 3.0-4.5    |
| phosphoric oxide (P <sub>2</sub> O <sub>5</sub> )      | 0-2.0;     |

(iv.) said flat glass ceramic comprises chemically prestressed float glass;

said chemically prestressed glass comprises: the sum of the percentage of lithium oxide (Li<sub>2</sub>O) and the percentage of sodium oxide (Na<sub>2</sub>O) being greater than 3.5 percent by weight based on oxide;

(v.) said flat glass ceramic comprises chemically prestressed glass;

(vi.) said flat glass ceramic comprises:

the sum of 3.2 times the percentage of zinc oxide (ZnO) and the

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percentage of titanium dioxide ( $\text{TiO}_2$ ) being equal to or less than 4.3 weight percent based on oxide;

to minimize surface crystal bands;

(vii.) said flat glass ceramic comprises:

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
less than 2.5 weight percent of titanium dioxide ( $\text{TiO}_2$ ), on an oxide basis;

to minimize coloration due to iron oxide and titanium dioxide upon vitrification of said flat float glass;

(viii.) said flat glass ceramic comprises glass being configured to have, at a thickness of 4 millimeters, light transmittances of one of:

more than 89 percent; and

more than 90 percent;

(ix.) said flat glass ceramic being substantially free of barium oxide ( $\text{BaO}$ );

(x.) said flat glass ceramic is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees

Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius;

(xi.) said flat glass ceramic comprises one of:

(a.) a flat glass ceramic comprising one of:

a transparent glass-ceramic;

a translucent glass-ceramic; and

an opaque glass-ceramic;

(b.) a glass-ceramic comprising keatite mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of one of:

from minus 0.5 five millionths per degree Kelvin to

0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15

millionths per degree Kelvin;



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(xii.) said flat glass ceramic comprises a transparent glass-ceramic comprising in weight percent based on oxide:  
less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );  
less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and  
less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
said glass-ceramic being configured to have a light transmittance, at 4 millimeters thickness, of less than eighty percent;

(xiii.) said flat glass ceramic comprises a glass-ceramic being colored with a coloring agent comprising at least one compound of: vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said colored glass-ceramic being configured to have a light transmittance of less than five percent at a thickness of 4 millimeters; and

(xiv.) said flat glass ceramic contains lithium oxide - aluminum oxide - silicon dioxide; and

wherein said flat glass ceramic comprises rhodium, zinc oxide, and tin oxide.

64. (original) The flat glass ceramic according to claim 62,

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comprising all of: (i.), (ii.), (iii.), (iv.), (v.), and (vi.):

(i.) one of (a.) and (b.):

(a.) said flat glass ceramic comprises in weight percent on an oxide basis a composition of:

|  |         |
|--|---------|
| lithium oxide ( $\text{Li}_2\text{O}$ )                  | 3.2-5.0 |
| sodium oxide ( $\text{Na}_2\text{O}$ )                   | 0-1.5   |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0-1.5   |
| with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) + |         |
| potassium oxide ( $\text{K}_2\text{O}$ )                 | 0.2-2.0 |
| magnesium oxide ( $\text{MgO}$ )                         | 0.1-2.2 |
| calcium oxide ( $\text{CaO}$ )                           | 0-1.5   |
| strontium oxide ( $\text{SrO}$ )                         | 0-1.5   |
| barium oxide ( $\text{BaO}$ )                            | 0-2.5   |
| zinc oxide ( $\text{ZnO}$ )                              | <1.5    |
| aluminum oxide ( $\text{Al}_2\text{O}_3$ )               | 19-25   |
| silicon dioxide ( $\text{SiO}_2$ )                       | 55-69   |
| titanium dioxide ( $\text{TiO}_2$ )                      | 1.0-5.0 |
| zirconium dioxide ( $\text{ZrO}_2$ )                     | 1.0-2.5 |
| tin dioxide ( $\text{SnO}_2$ )                           | <1.0    |

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with the sum of titanium dioxide ( $\text{TiO}_2$ ) +

zirconium dioxide ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 2.5-5.0

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-3.0;

(b.) said flat glass ceramic comprises in weight percent on  
an oxide basis a composition of:

lithium oxide ( $\text{Li}_2\text{O}$ ) 3.5-4.5

sodium oxide ( $\text{Na}_2\text{O}$ ) 0.2-1.0

potassium oxide ( $\text{K}_2\text{O}$ ) 0-0.8

with the sum of sodium oxide ( $\text{Na}_2\text{O}$ ) +

potassium oxide ( $\text{K}_2\text{O}$ ) 0.4-1.5

magnesium oxide ( $\text{MgO}$ ) 0.3-2.0

calcium oxide ( $\text{CaO}$ ) 0-1.0

strontium oxide ( $\text{SrO}$ ) 0-1.0

barium oxide ( $\text{BaO}$ ) 0-2.5

zinc oxide ( $\text{ZnO}$ )  $\leq 1.0$

aluminum oxide ( $\text{Al}_2\text{O}_3$ ) 19-24

silicon dioxide ( $\text{SiO}_2$ ) 60-68

titanium dioxide ( $\text{TiO}_2$ ) 1.0-2.0

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zirconium dioxide ( $\text{ZrO}_2$ ) 1.2-2.2

tin dioxide ( $\text{SnO}_2$ )  $\leq 0.6$

with the sum of titanium dioxide ( $\text{TiO}_2$ ) +

zirconium dioxide ( $\text{ZrO}_2$ ) +

tin dioxide ( $\text{SnO}_2$ ) 3.0-4.5

phosphoric oxide ( $\text{P}_2\text{O}_5$ ) 0-2.0;

(ii.) said flat glass ceramic comprises:

the sum of 3.2 times the percentage of zinc oxide ( $\text{ZnO}$ )  
and the percentage of titanium dioxide ( $\text{TiO}_2$ ) being equal to or  
less than 4.3 weight percent based on oxide;

to minimize surface crystal bands;

(iii.) said flat glass ceramic comprises:

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and  
less than 2.5 weight percent of titanium dioxide ( $\text{TiO}_2$ ), on an oxide  
basis;

to minimize coloration due to iron oxide and titanium  
dioxide upon vitrification;

(iv.) said flat glass ceramic comprises glass configured to have,  
at a thickness of 4 millimeters, light transmittances of one of:

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more than 89 percent; and

more than 90 percent;

(v.) said flat glass ceramic being substantially free of barium oxide (BaO);

(vi.) said flat glass ceramic is configured to have:

a coefficient of thermal expansion  $\alpha_{20/300}$  between 3.5 millionths per degree Kelvin and 5.0 millionths per degree Kelvin;

a transformation temperature  $T_g$  between 600 and 750 degrees Celsius; and

a processing temperature  $V_A$  below 1350 degrees Celsius; and comprising one of (viii.), (ix.), (x.), (xi.), and (xii.):

(viii.) said flat glass ceramic comprises colored glass;

said colored glass comprises a coloring agent;

said coloring agent comprising at least one compound of:  
vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), copper (Cu), nickel (Ni), selenium (Se), and chlorine (Cl);

(ix.) said flat glass ceramic comprises one of:

(a.) a transparent glass-ceramic;

a translucent glass-ceramic; and

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an opaque glass-ceramic;

(b.) a glass-ceramic comprising keatite mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  of less than 1.5 millionths per degree Kelvin;

(c.) a glass-ceramic comprising high quartz mixed crystals as the predominant crystal phase and said glass-ceramic being configured to have a coefficient of thermal expansion  $\alpha_{20/700}$  in the range of one of:

from minus 0.5 five millionths per degree Kelvin to 0.5 millionths per degree Kelvin; and

minus 0.15 millionths per degree Kelvin to 0.15 millionths per degree Kelvin;

(x.) said flat glass ceramic comprises a transparent glass-ceramic comprising in weight percent based on oxide:

less than 2 percent of titanium dioxide ( $\text{TiO}_2$ );

less than 0.5 percent of tin dioxide ( $\text{SnO}_2$ ); and

less than 200 parts per million iron oxide ( $\text{Fe}_2\text{O}_3$ ); and

said glass-ceramic being configured to have a light

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transmittance, at 4 millimeters thickness, of less than eighty percent;

(xi.) said flat glass ceramic comprises a glass-ceramic being colored with a coloring agent comprising at least one compound of: vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni);

said colored glass-ceramic being configured to have a light transmittance of less than five percent at a thickness of 4 millimeters; and

(xii.) said flat glass ceramic comprises chemically prestressed glass;

said chemically prestressed glass comprises:

the sum of the percentage of lithium oxide ( $\text{Li}_2\text{O}$ ) and the percentage of sodium oxide ( $\text{Na}_2\text{O}$ ) being greater than 3.5 percent by weight based on oxide; and

wherein said flat glass ceramic comprises rhodium, zinc oxide, and tin oxide.